

Appln. No. 09/228,772
Amendment dated November 10, 2003
Reply to Office Action dated August 8, 2003

REMARKS

Claims 1-16 were previously in the application. Claims 13-16 have been deemed allowable, and claims 4 and 6-10 were objected to, but were deemed allowable if rewritten in independent form including all of the limitations of the base claim and intervening claims. Claims 1-3, 5 and 11 and 12 were rejected. By this Amendment, claims 1, 2, 11 and 12 have been cancelled without prejudice, and claims 3-6 have been amended to recite the features of canceled claim 2, from which those claims previously depended. Formalistic amendments were also made to the specification and drawings. Accordingly, claims 3-10 and 13-16 are presently in the application. Claims 3, 4, 5, 6, 13 and 15 are independent.

Allowable Subject Matter

Applicants note with appreciation that, in the office action, claims 13-16 were deemed allowable, and claims 4 and 6-10 were objected to, but were deemed allowable if rewritten in independent form including all of the limitations of the base claim and intervening claims.

By this Amendment, claims 4 and 6 have been rewritten in independent form including all of the limitations of canceled base claim 2. Claim 8 depends from claim 4, while claim 10 depends from claim 6. Accordingly, applicants respectfully submit that the objections to claims 4, 6, 8 and 10 have been overcome, and applicants respectfully request the withdrawal of the objections to those claims.

Claims 7 and 9 depend from claims 3 and 5 respectively, the rejections to which are discussed below.

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**The Rejections Under
35 U.S.C. § 102(b)**

Claims 1, 2, 11 and 12 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,621,172 to Kanemasa et al.

By this Amendment, for the purpose of expediting prosecution, and in no way conceding the correctness of the rejections, claims 1, 2, 11 and 12 have been cancelled. Accordingly, applicants respectfully submit that the rejections to claims 1, 2, 11 and 12 under 35 U.S.C. § 102(b) have been made moot by the cancellation of those claims, and withdrawal of the rejections to those claims under 35 U.S.C. § 102(b) is respectfully requested.

**The Rejections Under
35 U.S.C. § 103(a)**

Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kanemasa in view of U.S. Patent No. 5,951,625 to Duttweiler. Applicants respectfully traverse the rejection.

First, applicants submit that there is no teaching or suggestion in the references to make the hypothetical combination proposed by the Examiner, and thus the combination is improper.

Claim 3 of the present application is directed to an adaptive filter utilizing a fast converging adaptive algorithm, means for modifying the algorithm by the application thereto of an adaptive scaled non-linearity, and a double talk detector connected to the adaptive filter for disabling the filter in response to the detection of double talk on a telephone circuit. The fast converging algorithm is PNLMS.

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Kanemasa describes a system for echo cancellation that includes a fast convergence algorithm. With reference to Kanemasa (see Kanemasa at FIG. 4 and col. 10, lns. 37-68 and col. 11, lns. 1-4), the examiner argues that an adaptive scaled non-linearity is achieved by multiplier 62, hysteresis characteristic circuit 64, and absolute value circuit 60. As conceded in the office action, however, Kanemasa does not describe use of a PNLMS algorithm, as is recited by claim 3 of the present application.

Duttweiler fails to cure this deficiency. Duttweiler describes an adaptive filter that uses a fast converging PNLMS algorithm to distribute adaptive energy evenly across a tap (see Duttweiler at FIG. 2 and col. 4, lns. 38-55). Importantly, Duttweiler does not describe an adaptive scaled non-linearity for modifying the adaptive coefficients or the use of a double-talk detector with an adaptive filter employing such adaptive scaled non-linearity.

Because the design and functionality of Duttweiler is not directed to the use of an adaptive scaled non-linearity for modifying adaptive coefficients, nor the use of a double-talk detector in conjunction with an adaptive filter using an adaptive scaled non-linearity, and in fact, Duttweiler is addressing a different problem in a different way than that of Kanemasa, a person of ordinary skill in the art would not look to make the proposed combination of Duttweiler with Kanemasa.

Moreover, because of the very different methodologies and structures described by Kanemasa and Duttweiler, the proposed hypothetical substitution of the PNLMS algorithm of Duttweiler into the system of Kanemasa would not yield the claimed invention. Specifically, if Duttweiler's PNLMS algorithm were to be inserted into the system of Kanemasa (see Kanemasa at FIG. 4), it would need be inserted in place of the multiplier 62, hysteresis characteristic circuit

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64, and absolute value circuit 60 of Kanemasa. This substitution, however, would result in an echo cancellation system without any adaptive scaled non-linearity, as any such functionality in Kanemasa would rely upon multiplier 62, hysteresis characteristic circuit 64, and absolute value circuit 60. While the hypothetical resulting circuit would include polarity discriminator 50 (see Kanemasa at FIG. 4), discriminator 50 of Kanemasa only provides for a non-linearity, but not a scaled non-linearity.

Therefore, applicants respectfully submit that even if one were to make the proposed hypothetical Kanemasa-Duttweiler combination, the resulting system would not contain all of the claimed features of claim 3 of the present application. Accordingly, applicants submit that claim 3 is patentable over the cited references, and respectfully request the withdrawal of the rejection to claim 3 under 35 U.S.C. § 103(a).

Claim 7 depends from claim 3, and thus, applicants respectfully submit that claim 7 is patentable at least for depending from allowable claim 3. Accordingly, applicants respectfully request the withdrawal of the rejection to claim 7 under 35 U.S.C. § 103(a).

Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kanemasa in view of U.S. Patent No. 5,428,562 to Gay. Applicants respectfully traverse the rejection.

First, applicants submit that there is no teaching or suggestion in the references to make the hypothetical combination proposed by the Examiner, and thus the combination is improper.

Claim 5 of the present application is directed to an adaptive filter utilizing a fast converging adaptive algorithm, means for modifying the algorithm by an adaptive scaled non-

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linearity, and a double talk detector connected to the adaptive filter for disabling the filter in response to the detection of double talk on a telephone circuit. The fast converging algorithm is APA.

As described above, Kanemasa describes a system for echo cancellation that includes a fast convergence algorithm. The examiner posits that an adaptive scaled non-linearity is achieved by multiplier 62, hysteresis characteristic circuit 64, and absolute value circuit 60. As conceded in the office action, however, Kanemasa does not describe use of an APA algorithm, as is recited by claim 5 of the present application.

Gay fails to cure this deficiency. Gay describes an adaptive filter wherein the fast converging algorithm is APA (see Gay at FIG. 1 and col. 2, lines 53-65) to achieve fast convergence through sample-by-sample updating with low complexity (see Gay at col. 1, lns. 46-47). Importantly, Gay does not teach an adaptive scaled non-linearity for modifying the adaptive coefficients or the use of a double-talk detector with an adaptive filter employing such adaptive scaled non-linearity.

As was discussed above with respect to the proposed hypothetical Kanemasa-Duttweiler combination, because the design and functionality of Gay is not directed to the use of an adaptive scaled non-linearity for modifying adaptive coefficients, nor the use of a double-talk detector in conjunction with an adaptive filter using an adaptive scaled non-linearity, a person of ordinary skill in the art would not look to make the proposed combination of Duttweiler with Gay.

Moreover, because of the very different methodologies and structures described by Kanemasa and Gay, a hypothetical substitution of the APA algorithm of Gay into the system of

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Kanemasa would not yield the claimed invention. Specifically, if Gay's APA algorithm were to be inserted into the system of Kanemasa (see Kanemasa at FIG. 4), it would need be inserted in place of the multiplier 62, hysteresis characteristic circuit 64, and absolute value circuit 60 of Kanemasa. This substitution, however, would yield an echo cancellation system without any adaptive scaled non-linearity, as any such functionality in Kanemasa would rely upon multiplier 62, hysteresis characteristic circuit 64, and absolute value circuit 60. While the hypothetical resulting circuit would include polarity discriminator 50, discriminator 50 of Kanemasa only provides for a non-linearity, but not a scaled non-linearity.

Therefore, applicants respectfully submit that even if one were to make the proposed hypothetical Kanemasa-Gay combination, the resulting system would not contain all of the claimed features of claim 5 of the present application. Accordingly, applicants submit that claim 5 is patentable over the cited references, and respectfully request the withdrawal of the rejection to claim 5 under 35 U.S.C. § 103(a).

Claim 9 depends from claim 5, and thus, applicants respectfully submit that claim 9 is patentable at least for depending from allowable claim 5. Accordingly, applicants respectfully request the withdrawal of the rejection to claim 9 under 35 U.S.C. § 103(a).

**Amendments to
the Drawings**

By this Amendment, applicants have made proposed changes to FIGS. 1 and 2. The proposed changes to FIGS. 1 and 2 include changing the text within the boxes denoting FIR filter 10 to read "finite" impulse response filter instead of --fast-- input response filter 10. Applicants respectfully submit that a person of ordinary skill in the art would recognize, upon

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reviewing the specification and drawings as filed, that the FIR filter described is a finite input response filter. For example, in the art, it is commonly understood that one main category of digital filters includes Finite Impulse Response (FIR) filters. Applicants note that in the drawings as originally filed, the identifier FIR was associated with filter 10. The identifier FIR was also associated with filter 10 in the text of the specification as filed, as is discussed below. Applicants respectfully submit that the use of the term "fast" impulse response filter for FIR filter 10 was an inadvertent typographical error which resulted from the improper expanding of the term FIR which was in the specifications and drawings as originally filed. Accordingly, applicants submit that no new matter is added by these amendments to the drawings, and entry of the proposed amendments is respectfully requested.

**Amendments to
the Specification**

By this Amendment, applicants have amended the specification in several locations to make the specification consistent with the drawing changes discussed above. Specifically, applicants have amended references to the FIR filter 10 to read "finite" impulse response filter instead of --fast-- input response filter 10. As was stated above with respect to the amendments to the drawings, applicants respectfully submit that a person of ordinary skill in the art would recognize, upon reviewing the specification and drawings as filed, that the FIR filter described is a finite input response filter. For example, as discussed above with respect to the amendments to the drawings, in the art, it is commonly understood that one main category of digital filters includes Finite Impulse Response (FIR) filters. Applicants note that in the drawings and in the specification as originally filed, the identifier FIR was associated with filter

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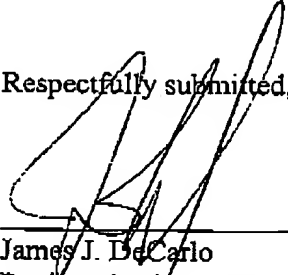
10. Applicants respectfully submit that the use of the term "fast" impulse response filter for FIR filter 10 was an inadvertent typographical error which resulted from the improper expanding of the term FIR which was in the specifications and drawings as originally filed. Accordingly, applicants submit that no new matter is added by these amendments, and entry of the proposed amendments is respectfully requested.

CONCLUSION

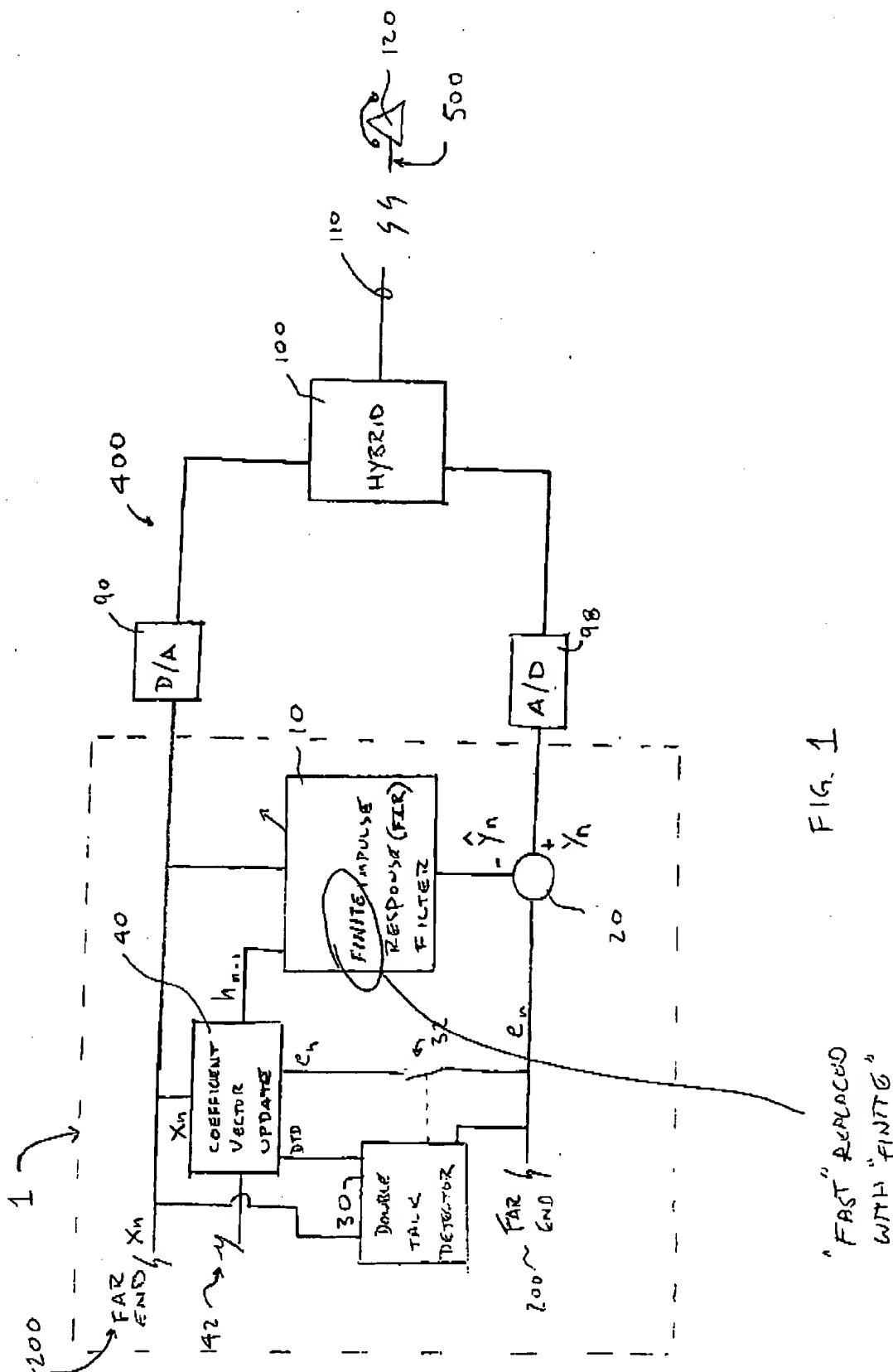
Applicants respectfully submit that all outstanding rejections have been addressed and are now either overcome or moot. Applicants further submit that all claims pending in this application (claims 3-10 and 13-16) are patentable over the prior art. Reconsideration and withdrawal of those rejections and objections is respectfully requested.

The Commissioner is authorized to charge any fee deficiencies to deposit account no. 19-4709.

Respectfully submitted,



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ANNOTATED SHEET

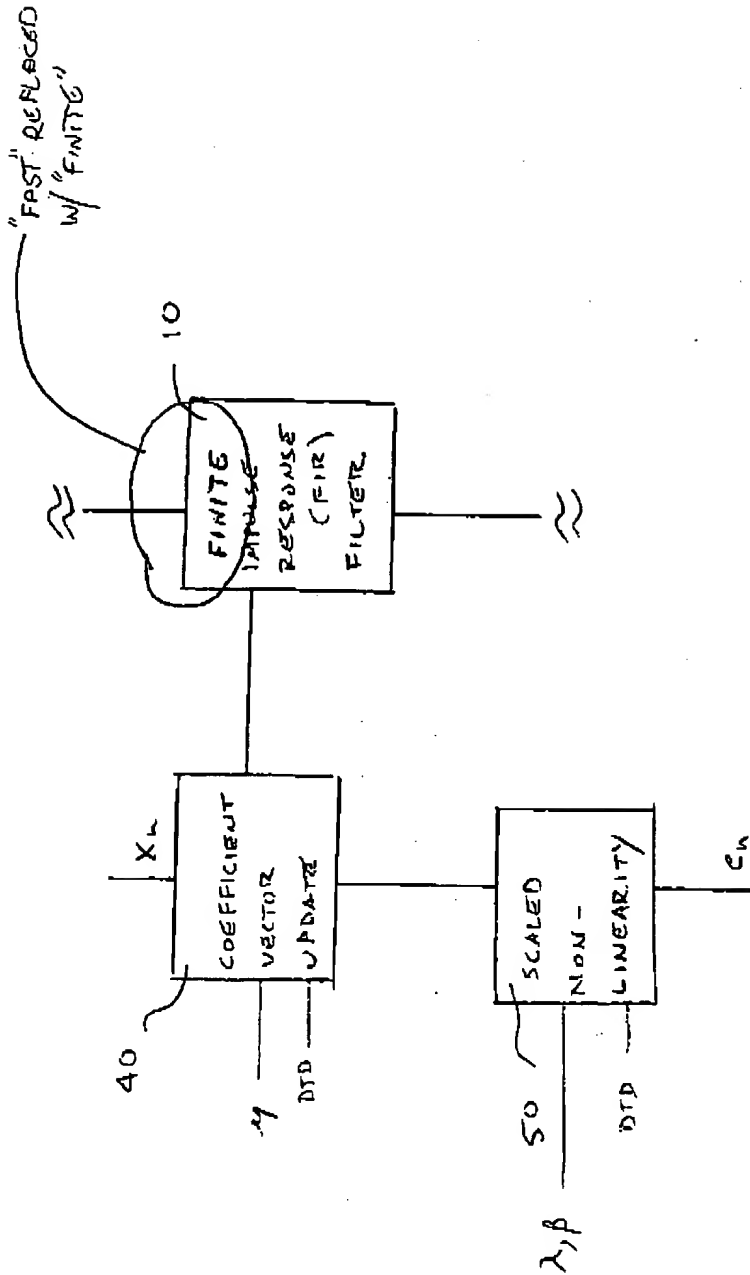


FIG. 2

ANNOTATED SHEET